



NOVEMBER 2023

HOOD CANAL REGIONAL POLLUTION IDENTIFICATION AND CORRECTION PROGRAM Phase IV: Protecting Public Health and Hood Canal through Regional Collaboration

Overview

The Hood Canal Regional Pollution Identification and Correction (HCRPIC) Program was formed in 2012 in response to water quality degradation that threatened Hood Canal's aquatic habitats and human wellbeing resources. Hood Canal's water quality partners joined together to form a cross-jurisdictional program centered on collaboration, knowledge-sharing, and shared goals – to improve water quality by correcting fecal pollution sources to protect public health and shellfish growing areas and restore and protect Hood Canal habitat. Our regional approach enables efficient, prioritized, and coordinated responses to pollution threats.

This National Estuary Program (NEP) grant funded HCRPIC Phase IV in 2020-2023, consisting of the following elements and results:

- **HCRPIC Program Guidance Group coordination support:** **Nine Guidance Group meetings** were held and attended by all regional partners
- **PIC fieldwork in Mason County:** **12.3 miles** of shoreline monitored, **137 parcel surveys** conducted, **10 OSS failures** identified and corrected (or repairs in progress)
- **Ambient stream monitoring in south Hood Canal utilizing citizen volunteers:** **210 stream samples** collected at **12 sites** which all found good water quality
- **On-site sewage system (OSS) maintenance rebates:** **73 rebates** dispersed for OSS pumping, inspections, or small repairs
- **Outreach and education:** **HCRPIC StoryMap** developed and hosted on HCCC.wa.gov/PIC
- **Technical assistance and field training:** HCRPIC Program Field Guide updated with COVID precautions; new Mason County water quality staff and 30 citizen volunteers trained

Other long-term program highlights achieved in Phase IV include:

- One mile of Hoodspout area beaches and 66 acres of shellfish beds were opened for harvest for the first time in five decades due to water quality improvements achieved through the coordinated work of HCRPIC partners.

- Mason County established a Clean Water District which now funds its water quality program after years of strategic planning support from HCRPIC Program partners. Mason County joins the other Hood Canal counties in providing their own base level of stable, sustainable funding for ongoing PIC activities.

HCRPIC Program grant funding leverages and coordinates a large amount of water quality investigation and correction work funded through other sources throughout Hood Canal. Since 2012, moderate NEP grant awards have been effectively utilized to produce strong, professional results.

Background and Approach

Hood Canal is a glacier-carved fjord more than 60 miles long forming the westernmost waterway of the Puget Sound basin. Its rivers and estuaries sustain salmon runs year-round and its beaches support extensive wild and commercial shellfish populations. The Canal has great cultural, economic, and subsistence value to its tribes, residents, and visitors. The area is also home to more than 29,000 onsite sewage systems (OSS), many close to Hood Canal beaches and streams, that can become water pollution sources. Pollution Identification and Correction (PIC) plays a critical role keeping Hood Canal's beaches and nearshore waters safe for use and open for shellfish harvest by preventing and reducing pollution from human and animal waste.

The Hood Canal Coordinating Council (HCCC) partnered with member jurisdictions to develop and implement the HCRPIC Program with NEP funding from 2012-2023 to protect public health and shellfish growing areas and restore water quality by correcting fecal pollution sources, and to restore and protect Hood Canal habitat. The HCRPIC Program provides a unique opportunity to combine and share partner strengths, experience, and resources to build a robust regional program to protect Hood Canal. HCRPIC partners include Jefferson, Kitsap, and Mason Counties, the Port Gamble S'Klallam and Skokomish Tribes, the Hood Canal Salmon Enhancement Group (HCSEG), Jefferson, Kitsap, and Mason Conservation Districts, HCCC, and the Washington State Departments of Health (WSDOH) and Ecology.

The PIC approach prioritizes shoreline survey areas to identify pollution hotspots threatening Hood Canal water quality. Local health jurisdiction staff investigate and identify fecal pollution sources and work with property owners to correct them. HCRPIC's regional work group partners grew into an effective cross-jurisdictional Guidance Group that shares methods, tools and techniques, and partners for field work, problem solving, outreach strategies, and reporting.

In Phase IV, the HCRPIC Program's activities and objectives were developed into a shared workplan ([linked here](#)) outlining priority field work areas, field work procedures, data reporting instructions, field training resources, OSS maintenance rebate rules and procedures, and communications activities and resources. HCRPIC field work procedures in compliance with the approved Quality Assurance Project Plan (QAPP) are further described in the HCRPIC Program Field Guide (see [workplan](#) for links), developed during Phase III and updated in Phase IV with an addendum addressing COVID guidance for PIC procedures.

The collaboration between county health jurisdictions and tribal natural resource staff is a valuable aspect of the HCRPIC Program. The Port Gamble S'Klallam Tribe has assisted the Guidance Group since inception, enhancing the breadth of the regional partnership by researching and piloting fecal pollution identification tools in areas where PIC methods have not succeeded. The Skokomish Tribe is also very active in the Guidance Group, and HCRPIC program implementation. The Skokomish Tribe reallocated their early HCRPIC grant funding to pilot the very successful regional OSS Maintenance Rebate Program. In addition to their

own water quality monitoring, they provide guidance for regional plans and hotspot investigations supporting partner PIC investigations to improve the tribe's access to treaty resources. The Skokomish Tribe's staff alerted the regional team to rich shellfish resources in Hoodspout where harvest had long been prohibited and helped build and implement a PIC strategy to improve the area's water quality to support the opening of Hoodspout shellfish beds for harvest.

Evaluation

The HCRPIC Program Phase IV Quality Assurance Project Plan (QAPP) addendum was submitted June 16, 2020, and the final QAPP ([linked here](#)) was approved August 19, 2020. The program followed the approved QAPP procedures and met or exceeded all project goals. HCRPIC Program Field Guides summarize QAPP procedures in an easy-to-read instruction manual.

Priority shoreline survey areas are identified in the HCRPIC Program Phase IV Workplan ([linked here](#)). All water sampling data was entered into EPA's Water Quality eXchange. The project's evaluation plan details all data collection parameters ([linked here](#)).

HCRPIC partners recorded their field work data in the program's cumulative data report, which collects information on PIC sampling hotspots and pollution source investigations, tracks parcel survey results, OSS deficiencies and failure conditions, dye tests results, progress toward corrections, and records shoreline sampling locations, and OSS maintenance rebates provided.

Conclusions

Hood Canal water quality is steadily improving. There continue to be some challenging areas, where sustained water quality upgrades remain elusive. However, HCRPIC partners are working together to address known problems and prevent future pollution sources from impacting our waters and habitats. This small amount of grant funding sustains the regional program and acts as seed money for invaluable regional coordination that builds momentum to solve regional water quality issues; it enables regional tracking of issues, implementation follow-up from all parties, cross-jurisdictional collaboration and relationship-building, generates creativity in problem-solving and technical advancements in each other's approaches, and imposes accountability that focuses and motivates the Hood Canal partners' field work. The field work outputs funded by this grant are multiplied many times over by the work of the other HCRPIC partners that is funded by other sources.

In Phase IV, the regional PIC program far exceeded our grant commitments and achieved many great successes:

- Mason County Health conducted shoreline surveys and pollution investigations far exceeding the goals of the grant (Table 1):
 - o Completed 12.3 miles of shoreline surveys, four times more than committed
 - o Completed 137 parcel surveys, double the number committed
 - o Identified 10 OSS failures, double the number committed
 - All OSS failures are repaired or have repairs in progress
- HCRPIC partners administered 73 OSS maintenance rebates, which helped fund property owners' OSS maintenance and small repairs to prevent future water quality pollution sources; Table 2 and Figures 1-4 show the voucher results in more detail; highlights include:

- 50% of voucher recipients' OSS had not received maintenance in over five years; One OSS had no record of permit or previous service
 - 61% of voucher recipients' OSS were over 30 years old
 - 67% of vouchers were used for OSS pumping or inspections; 33% were used for small repairs; Figure 3 shows the frequency of all maintenance and repairs conducted using rebates
 - A variety of deficiencies were found or addressed by the OSS maintenance vouchers, the most frequent were high solids and pump failures; Figure 4 shows the frequency of all deficiencies found
- Ambient monitoring found clean water quality at 12 freshwater sites in south Hood Canal:
 - All 12 monitoring stations (Figure 5) met the state freshwater standard for bacteria (Table 3)
 - HCSEG volunteers collected 210 water samples in high priority areas during 18 sampling events, more than twice as many than committed
 - 12 citizen volunteers put in 140 hours of time collecting water samples
 - The persistent problem area of Annas Bay is showing slow but consistent improvements in both marine and freshwater due to the coordinated effort invested by Mason County, the Skokomish Tribe, Mason Conservation District, and WA Departments of Health and Ecology
 - Sustainable funding strategic work helped Mason County develop and establish a Clean Water District in 2022, providing sustainable water quality program funding
 - HCRPIC's Ambient Monitoring Program has jumpstarted Mason County's Clean Water District programming, which has taken over ambient monitoring of south Hood Canal
 - HCRPIC partners achieved the long sought-after upgrade of 66 acres of previously prohibited shellfish beds at Hoodsport, enabling tribal and public harvest of the immense shellfish resource at the site's two public beaches
 - This event garnered media coverage in many publications across the state and the country (links provided in Table 4)
 - HCRPIC Coordinators produced a [StoryMap](#) to convey the history of water quality work being conducted throughout Hood Canal and demonstrate the effectiveness of the HCRPIC Program
 - HCRPIC coordinators utilized the StoryMap to present HCRPIC successes and lessons learned at the 2022 Salish Sea Ecosystem Conference
 - The [HCRPIC Program StoryMap](#) is hosted on HCCC's website and available for all partners to use in presentations to the public and partners (Appendix B)
 - HCCC facilitated nine Guidance Group meetings. All meeting agendas and summaries can be found at [HCCC.wa.gov/PIC](https://hccc.wa.gov/PIC)
 - HCRPIC technical coordinator provided technical assistance throughout the grant duration. HCRPIC coordinators updated the HCRPIC Program Field Guide with an Addendum addressing adapted procedures during the COVID pandemic; new Mason County water quality staff were trained by the HCRPIC technical coordinator; 30 citizen volunteers were trained to collect freshwater samples

Through the duration of the Phase IV grant, HCRPIC partners faced unforeseen adversity that impacted activities. The COVID pandemic brought safety concerns that required staff to change field work procedures, as well as put a strain on public health jurisdiction staff, often drawing them away from water quality work for an extended period to respond to the COVID outbreak. HCCC also faced unpredicted and extreme staffing constraints that affected the administration of this grant. However, the established

relationships among HCRPIC Program partners and their consistent commitment to Hood Canal water quality kept grant activities progressing toward the positive outcomes listed above.

Recommendations and next steps

The HCRPIC PIC Program has achieved success with traditional water quality sampling methods relying on fecal coliform and E.coli monitoring. HCRPIC partners will continue to repair identified OSS failures initiated during this grant and collaborate toward water quality improvements. HCRPIC partners highly value the program's cross-jurisdictional collaboration that brings both local, state, and tribal governments together to share knowledge, coordinate resources, and collectively problem solve toward shared desired outcomes. Specific recommendations based on our collective experience include:

- Strategic partnerships and coordinated efforts leverage resources for greater outcomes, quickly identifies problems, builds momentum for focused work toward lasting solutions
- Data-guided priority setting efficiently utilizes limited resources to systematically protect water quality
- Regional coordination amplifies benefits:
 - o Regional programs benefit from a planning phase, to build a regional work group and develop shared guidance materials
 - o Regional programs can add efficiencies by sharing time-consuming grant application, administration, and reporting
 - o Supplemental funding through a regional funding source can fill gaps in local water quality program funding and pursue emerging issues and technologies that are otherwise difficult to fund
 - o Regional support jumpstarts development and builds momentum for local funding of water quality work
- OSS maintenance rebates protect water quality - they bring property owners into compliance, gather information about unknown OSS in high priority areas, incentivize proactive and routine OSS maintenance, and provide a means for the local health jurisdiction to build relationships with property owners
- Community partnerships can expand monitoring efforts and empower citizens as ambassadors of Hood Canal water quality
- The Hood Canal region should continue to explore future funding to coordinate and implement regional PIC work, and:
 - o Expand water quality investigation methods and tools to identify hard-to-track pollution sources
 - o Continue to develop effective outreach materials for the public and decision-makers and find ways to celebrate successes
 - o Fund stormwater best management practices on private property in high priority areas

The HCRPIC Program will continue to provide a collaborative space for this work into the future and will look to obtain supplemental funding to advance the group's water quality protection activities in Hood Canal.

Appendices

Appendix A: Tables and Figures

Appendix B: HCRPIC Program Story Map

For more information:

hccc.wa.gov/PIC

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This project is part of the **Puget Sound National Estuary Program**.

The National Estuary Program is a place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance.

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Appendix A: Tables and Figures

Tables

Table 1: HCRPIC Program Phase IV Mason County Field Work Results

Local Health Jurisdiction	Shoreline Surveys (miles)	Parcel Surveys		OSS Failures		OSS Repairs	
		Ph. 4 Grant Goal	Number Conducted	Ph. 4 Grant Goal	Number Identified	Completed	In Progress
Mason County Public Health	12.3	75	137	5	10	3	6

Table 2: HCRPIC Ph. IV OSS Maintenance Vouchers Administered

County	Number of Rebates	Amount Dispersed
Kitsap	34	\$12,179
Mason	25	\$9,295
Jefferson	14	\$4,494
Total	73	\$25,968

Table 3: HCRPIC Ph. IV Ambient Stream Monitoring Results

Stream	Number of Samples	Geometric mean (FC/100ml)	FC Standard	
			Meets Part 1	Meets Part 2
Big Mission Creek	18	15	Yes	Yes
Dewatto Creek	18	9	Yes	Yes
Deveraux Creek	14	27	Yes	Yes
Finch Creek	18	2	Yes	Yes
Big Bend Creek	18	15	Yes	Yes
Alderbrook Creek	18	4	Yes	Yes
Lilliwaup Creek	17	7	Yes	Yes
Little Mission	17	11	Yes	Yes
Mulburg Creek	18	13	Yes	Yes
Tahuya River	18	9	Yes	Yes
Trails End Creek	18	12	Yes	Yes
Union River	18	56	Yes	Yes

FC Standard:
 Part 1: <u>100</u> FC/100 ml (geometric mean)
 Part 2: Not more than 10% of all samples > 200 FC/100 ml.

Table 4: Hoodsport Shellfish Bed Re-opening Media Coverage

Article Title (linked)	Publication
A mile of shellfish beach near Hoodsport has been declared safe for harvesting	Puget Sound Institute – UW Tacoma
Hoodsport beaches to open for shellfish harvesting for first time in 45 years	Seattle Times
Hoodsport area to open for shellfish harvesting	The Columbian
After 4-year cleanup, Hoodsport area to open for shellfish harvesting	Komo News
Hoodsport area to open for shellfish harvesting	Associated Press
Skokomish Tribe and Partners Upgrade Hoodsport Water Quality	Northwest Treaty Tribes
Hoodsport beaches to open for shellfish	My Clallam County
Hoodsport area to open for shellfish harvesting	Source One News
Hoodsport area to open for shellfish harvesting	KMAS Radio Story
Hoodsport beaches to open for shellfish harvesting for first time in 45 years	The Wenatchee World
Hoodsport area to open for shellfish harvesting	Q13 News Seattle
PROJECT: HOODSPORT SHELLFISH BED REOPENED FOR HARVEST – Shellfish harvesting in a stretch of the southern Hood Canal after nearly half a century	Puget Sound Partnership - State of the Sound 2023, pages 130-131

Figures

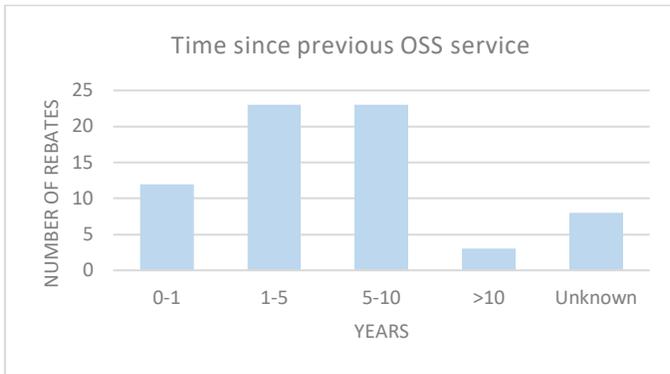


Figure 1: OSS Maintenance Voucher Results: Time Since Previous OSS Service

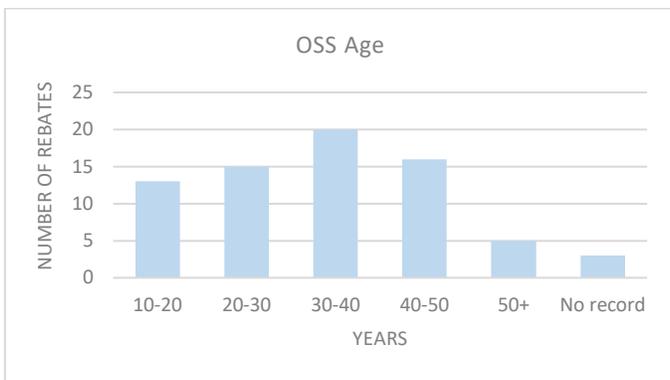


Figure 2: OSS Maintenance Voucher Results: OSS Age

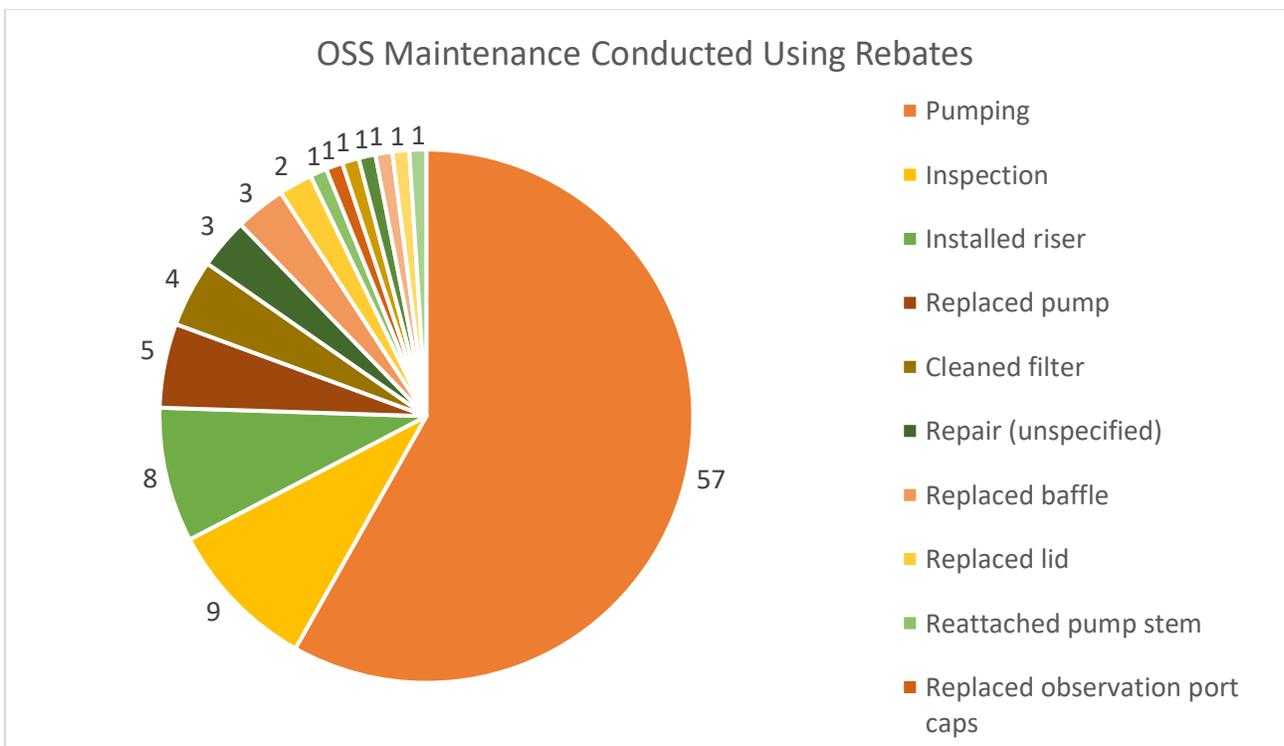


Figure 3: OSS Maintenance Conducted Using HCRPIC Ph. IV Rebates

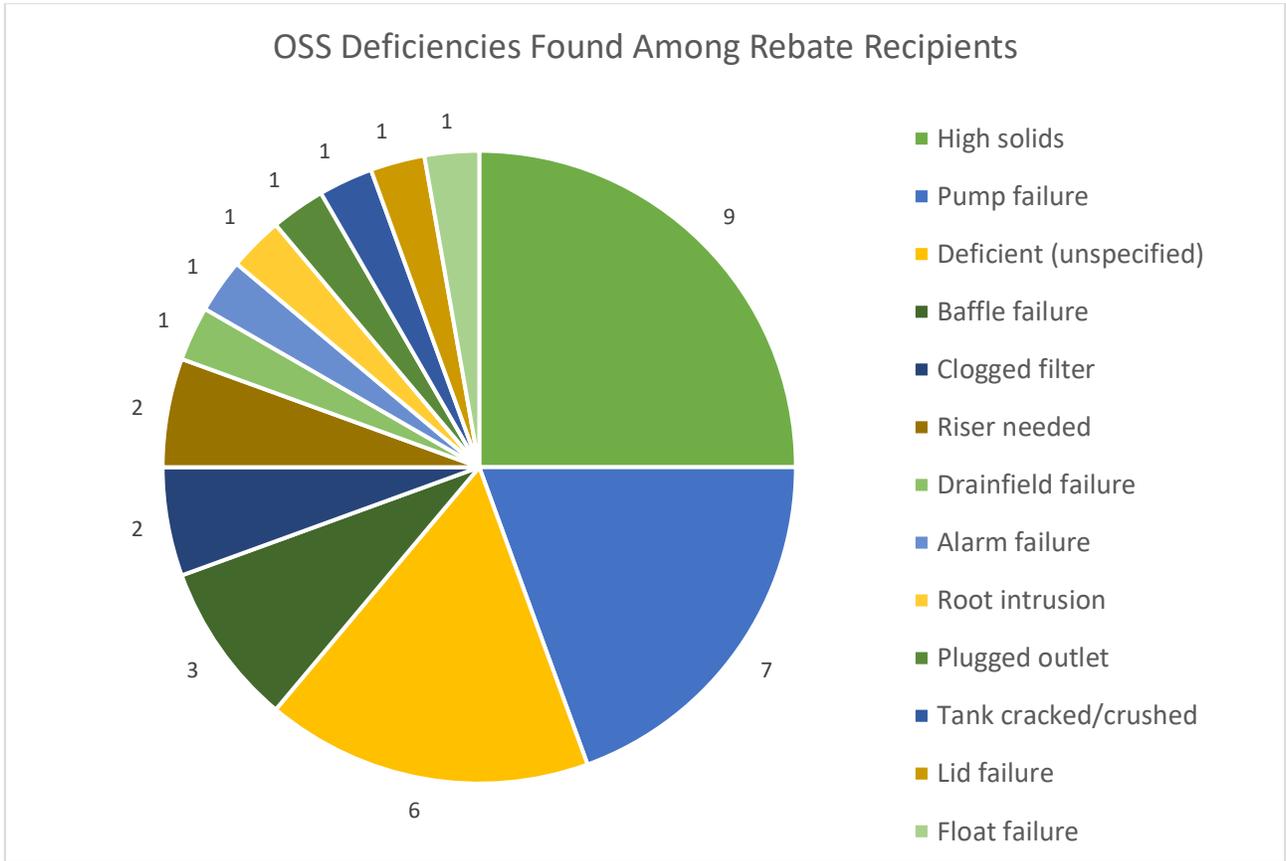


Figure 4: OSS Deficiencies found and/or addressed by HCRPIC Ph. IV OSS Maintenance Rebates

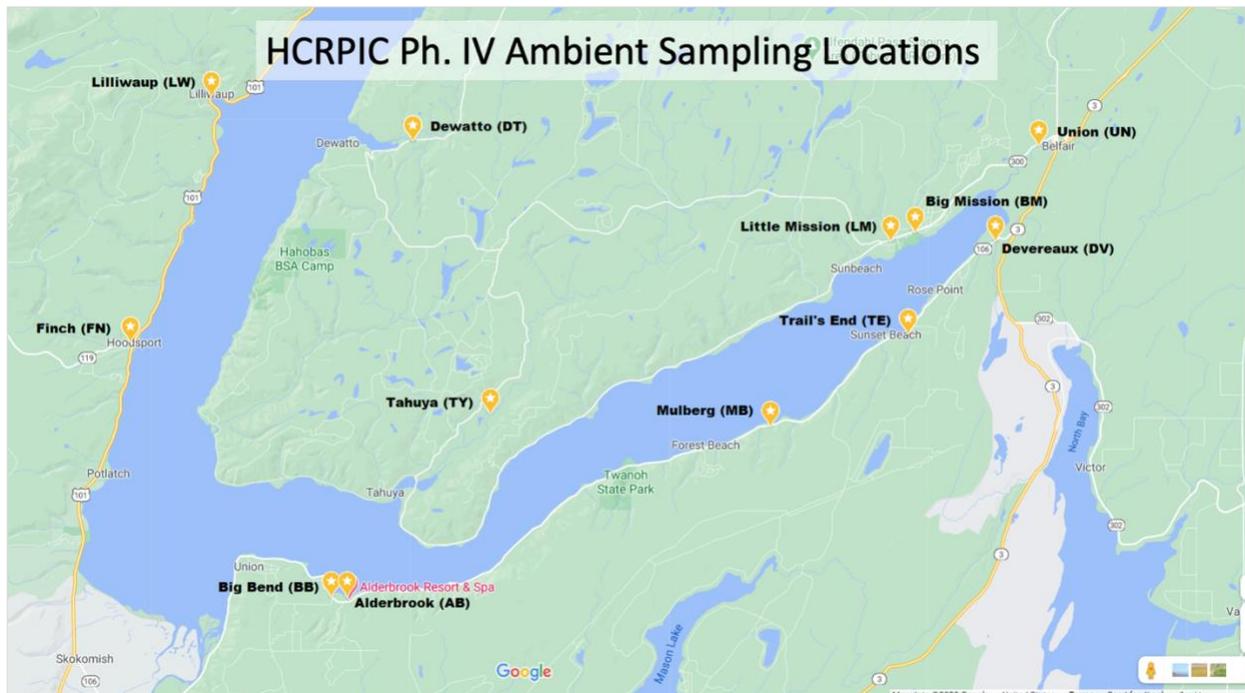
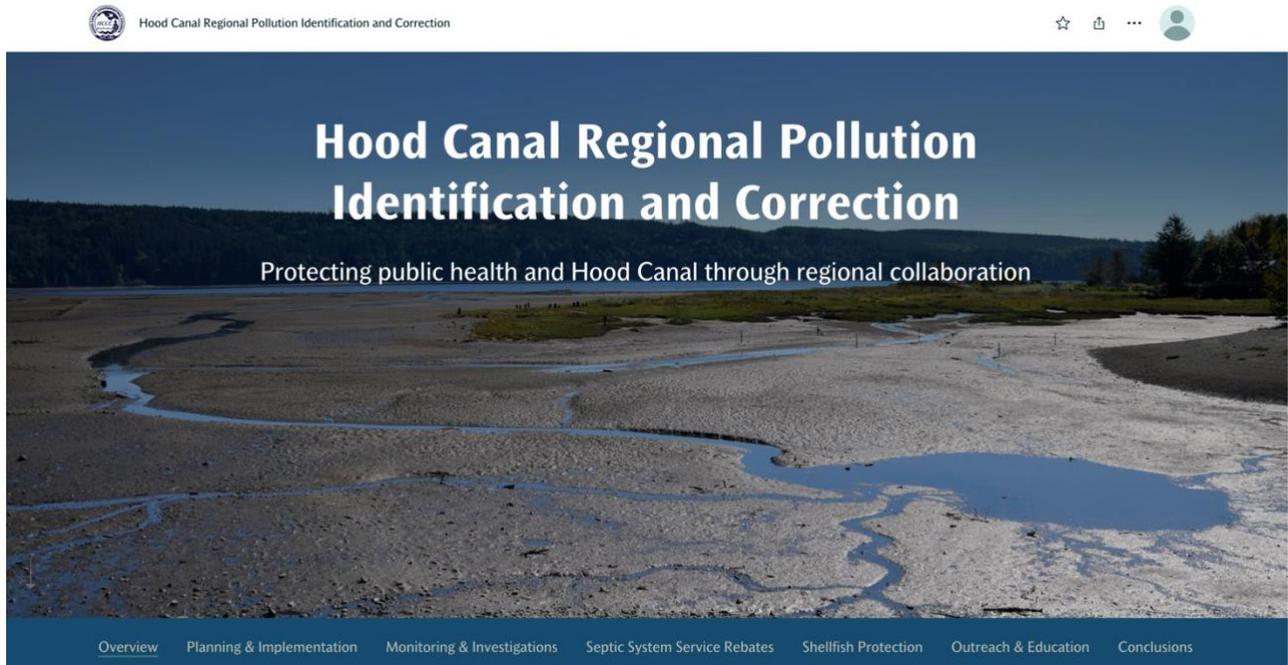


Figure 5: HCRPIC Ph. IV Ambient Stream Sampling Locations

Appendix B: HCRPIC Program StoryMap

Excerpted screenshots are shown below, [click here](#) to view the entire StoryMap.



Overview

Hood Canal is a natural, glacier-carved fjord more than 60 miles long, forming the westernmost waterway and margin of the Puget Sound basin. Its rivers and estuaries sustain salmon runs throughout the year and its beaches support extensive wild and commercial shellfish populations.

The Canal has great cultural, economic, and subsistence value to its tribes, residents, and visitors. The water itself connects people to this place, whether it's through

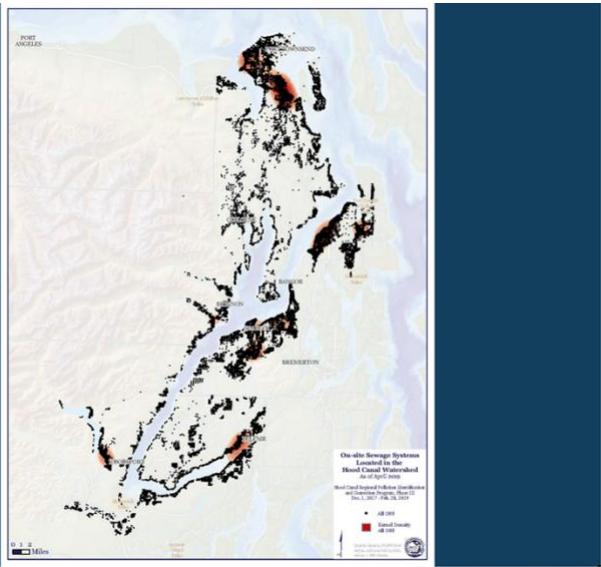
The map shows the Puget Sound region with Hood Canal highlighted in blue. Key locations labeled include Pacific Rim National Park Reserve, Duncan, Victoria, Seattle, Tacoma, Olympia, Mount Rainier National Park, Wenatchee National Forest, and Yakima. The map is credited to Earthstar Geographics | County of Skagitzi WPM, State Parks GIS, Esri, HERE, and is powered by Bing.

Location of Hood Canal. Click the map to expand it and zoom in or out.

①

The Hood Canal region is also home to more than 29,000 on-site sewage systems (OSS), which can fail as they age, contributing bacterial pollution to Hood Canal streams and beaches. Many OSS are in close proximity to water bodies.

01 / 05



Pollution Identification and Correction (PIC) and other water quality programs are essential to protecting public health by reducing bacterial and nutrient pollution sources. A regional PIC approach enables efficient, prioritized, and coordinated responses to pollution threats.

The Hood Canal Regional Pollution Identification and Correction (HCRPIC) Program partners include Jefferson, Kitsap, and Mason Counties, the Port Gamble S'Klallam and Skokomish Tribes, the Hood Canal Salmon Enhancement Group, Jefferson, Kitsap, and Mason Conservation Districts, and the Hood Canal Coordinating Council (HCCC), as well as our state agency partners, the Washington Departments of Health and Ecology.



02 / 05

The HCRPIC Program plays a critical role keeping Hood Canal's beaches and nearshore waters safe for use and open for shellfish harvest by preventing and reducing pollution from human and animal waste.

Zoom into the map at right from WA Dept. of Health to view the current water quality status of Hood Canal's beaches and shellfish beds. Click here for a similar map showing only commercial shellfish growing areas.

The PIC approach involves prioritized shoreline surveys to identify pollution threatening Hood Canal's water quality. When a pollution hotspot is confirmed, it is tracked up the drainage to its source, where local health jurisdiction staff work with the property owner to correct the problem.



03 / 05



Between 2015-2016, the partners grew the regional work group into an effective Guidance Group, resulting in shared methods, tools and techniques, field work partnerships, problem solving, and networking opportunities.

The HCRPIC program facilitators coordinated Phase 2 administration, allowing local jurisdictions to focus their efforts on pollution identification and correction tasks.

03 / 05



Phase 4 (2019 - 2022)

The current Phase 4 began in December 2019. The final report will be available in late 2022.

The Phase 4 Workplan, developed by the HCRPIC Guidance Group, describes the timeline, priority areas, procedures and guidelines for Phase 4 activities.

[Phase 4 Workplan](#)

05
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05

Monitoring & Investigations

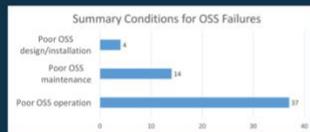
Shoreline Surveys, Site Visits, and Pollution Source Investigations

Throughout Hood Canal Regional Pollution Identification and Correction (HCRPIC) Program implementation, Jefferson, Kitsap, and Mason Counties conducted prioritized shoreline surveys (the inventory and bacterial assessment of all flowing fresh water discharges to the shoreline), site visits, and pollution source investigations.



In Phase 2, the jurisdictions collectively conducted 66.1 miles of shoreline

Overall, from 2015-2022, HCRPIC Program partners have made enormous strides protecting Hood Canal's water quality.



Summary conditions for OSS failures identified across Jefferson, Kitsap, and Mason Counties during site visits



143.3
miles of
shoreline
monitored



1,342
site visits
conducted



144
OSS
failures
identified



105
OSS repairs
completed (and
many more in
progress)



2 Kitsap Public Health District

Between 2015 and 2019, Kitsap Public Health District provided 65 rebates, identified 30 OSS deficiencies, and repaired 17 septic tanks.

Kitsap Health found that more than half of the inspections identified and corrected at least one deficiency or concern. Nearly 40 percent of the systems serviced had moderate or high levels of solids, indicating that tank

02 / 03

Kitsap Public Health District

 **65** rebates for OSS maintenance

17
septic tanks repaired



30
OSS deficiencies identified



1



Hoodport's Historic Harvest

In May 2014, the Skokomish Tribe recognized an opportunity to work with the HCRPIC Program to focus our coordinated efforts to improve water quality in a rich shellfish resource area in Hoodport that was closed for decades due to pollution concerns.

HCRPIC partners, including Mason County Public Health (Mason Health), the Skokomish Tribe, WSDOH, HCCC, and Kitsap Public Health District (Kitsap Health) coordinated Hoodport early action planning and worked together under combined funding sources to bring historical knowledge and data, and new assessments of shoreline drainages and marine water in the area, to conduct investigations and complete pollution corrections in order to open the Hoodport shellfish beds for harvest. This coordinated work is the result of the strong inter-jurisdictional relationships built through the HCRPIC Program.

The map illustrates the combined PIC work that occurred in the Hoodport area to correct longstanding pollution problems.

The HCRPIC Guidance Group has achieved success with traditional water quality sampling methods relying on fecal coliform monitoring. However, Guidance Group members have expressed interest in expanding the water quality investigatory methods and tools they have at their disposal to identify hard-to-track pollution sources. Pending funding, future phases of the HCRPIC program may consider the following advanced water quality investigations:

- Pilot Microbial Source Tracking (MST)/Environmental DNA (eDNA) sampling investigation
- Monitoring water quality biomarkers other than fecal coliform

